

WORK ORDER 2014-65

Date opened: 25 August 2014

Project: Pilot Step  
Type: Bell 206L/407

Batch Quantity: 2 x 62340-01-03 Step Assembly


Approval: SH00-48  
Drawing List: DCL623

Fabrication and Assembly Drawing(s)	Description
62340, Rev. 1	Pilot Step Assembly

Complete material tracking information on attached pages.

## Work Order pre-completion Inspection:

Project is on Approval Limitation Record:	<u>Y</u>
Document Control List revision level matches (or exceeds) STC:	<u>Y</u>
Drawings revision levels match Document Control List:	<u>Y</u>
Purchase order or Work order source is recorded for each part/ass'y:	<u>Y</u>
Tests and inspections specifically called out on drawings are complete:	<u>Y</u>
Release tags associated with all fabricated parts are attached:	<u>Y</u>
All mounting hardware and supplies are included:	<u>Y</u>

List all non-conformities raised: Radius increased to 1.14 to  
accommodate larger cross tube. Minor change required.Inspector Signature: Date: 29 Aug 14

- ① CUT STOCK MAT'L - 2x4 @ 5.5 long  
- 3.5x1 @ 3.75 long

② Machining

③ Clean up Aluminum Parts

- ④ Cut step stock - 1.0 x 0.065 304 @ 7.25 long  
-  $7/8$  x 0.065 @ 1.75 long  
-  $\phi 1.25$  Cap from 0.050 sheet 304

⑤ Face ends of tubes flush

- ⑥ Weld -  $7/8$  inside 1.0, flush w/end  
- Cap, flush on bottom edge.

⑦ Aluma prep + alodine Aluminum parts.

- ⑧ Press step tube ass'y into socket  
- drill  $3/16$  through socket holes  
- insert spring pin

⑨ Paint

⑩ Final Inspection

Drawing: **62340** Revision **0**  
 Assembly: **62340-01-02 Step Assembly**

Qty Per	Part #	Description	Material	P.O.W.O.	Checked
2	62340-01-02	Step Assembly			
.1	62340-02-02	Socket Clamp	4 x 2 Bar, 6061-T6 Aluminum	14059	
.2	62340-03-02	Clamp	1 x 3.5 Bar, 6061-T6 Aluminum	<u>1x4</u> 14017	
.1	62340-04	Step Tube	1.0 x 0.065 Tube, 304 Stainless Steel	13077	
.1	62340-05	Tube	0.875 x 0.035 Tube, 304 Stainless Steel	14014	
.1	62340-06	Cap	0.050" Sheet, 304 Stainless Steel	10037	
.2	FT4F-175H	T- Bolt		12125	
.2	AN4-14A	Bolt		14055	
.6	NAS1149F0463P	Washer		13048	
.4	MS21044N4	Nut		12067	
.1	MS16562-240	Spring Pin		11105	
.1		GRIP TAPE (1")	3M SAFETY WALK	11091	

Processes	Per	Mat'ls Used	Inspection	Signature
Welding	AMS2685C	ER308L Rod	Pot# 14028	Davis AD-05
Final Inspection	Drawing 62340			QC AD-02

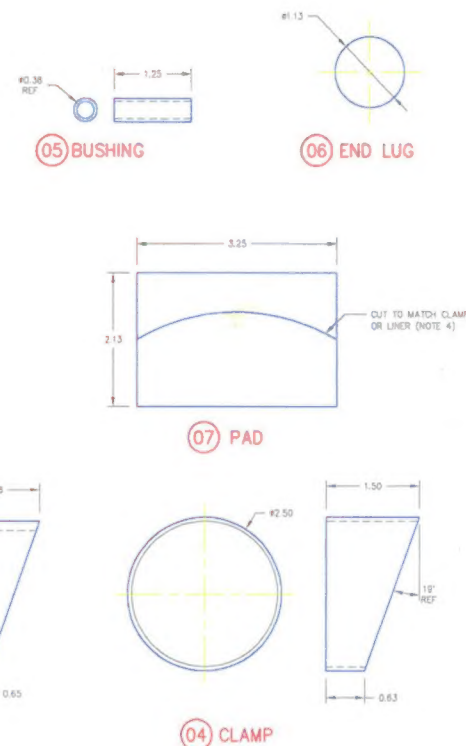
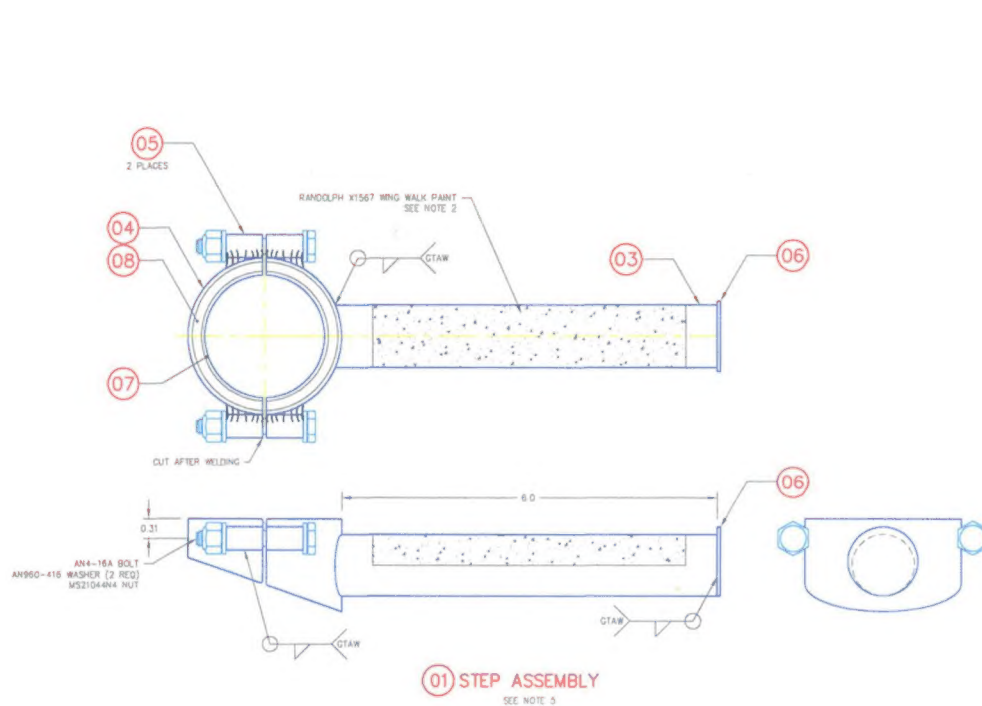
Tag incomplete parts with Work Order # when stored between processes.

Tag complete parts / assemblies with Release Tag prior to storage.

1. Approving Civil Aviation Authority/Country <b>Transport Canada</b>		2. AUTHORIZED RELEASE CERTIFICATE FORM ONE			3. Form Tracking No.	
4. Organization Name and Address <b>AERO Design Ltd. – 9888A Malaspina Road, Powell River, BC, V8A 0G3</b>					5. Work Order/Contract/Invoice <b>WO 2014-65</b>	
6. Item	7. Description	8. Part Number	9. Qty.	10. Serial/Batch No.	11. Status/Work	
	<b>Pilot Peg Step Ass'y</b>	<b>62340-01-03</b>	<b>2</b>	<b>N/A</b>	<b>New</b>	
12. Remarks						
13a. Certifies that the items identified above were manufactured in conformity to:  <input checked="" type="checkbox"/> Approved design data and are in condition for safe operation. <input type="checkbox"/> Non approved design data specified in block 12.				14a. <input type="checkbox"/> CAR 571.10 Maintenance Release <input type="checkbox"/> Other regulation specified in block 12 Certifies that unless otherwise specified in block 12, the work identified in block 11 and described in block 12, has been performed in compliance with the Canadian Aviation Regulations.		
13b. Signature <i>Jeff Clarke</i>		13c. Approved Organization Number <b>AMF 73-04</b>		14b. Signature		14c. Approved Organization Number
13d. Name <b>Jeff Clarke - AD02</b>		13e. Date (dd/mmm/yyyy) <b>29 Aug 2014</b>		14d. Name		14e. Date (dd/mmm/yyyy)
<p align="center"><b>Installer Responsibilities</b></p> <p>This certificate does not constitute authority to install.</p> <p>Installers working in accordance with the national regulations of a country other than that specified in block 1 must ensure that their regulations recognize certifications from the country specified.</p> <p>Statements in blocks 13a or 14a do not constitute installation certification. In all cases, the technical record for the aircraft must contain an installation certification issued in accordance with the applicable national regulations before the aircraft may be flown.</p>						



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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		
1	LINER ADDED	BJC	JAN 13/05
2	ROTATION ANGLE CHANGED, SINGLE ASSEMBLY FOR LEFT/RIGHT	BJC	SEPT 8/06



#### NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.
2. STEP ASSEMBLY TO BE THOROUGHLY DEGREASED AND POWDER COATED. PAINT RANDOLPH X1567 RING WALK GRIP PAINT ON TOP SURFACE OF TUBE.
3. WELDING OF 4130 STEEL TO BE COMPLETED BY GTAW METHOD TO AMS 2685C. WELDING ROD SHALL CONFORM TO ER70S-2 OR LATER REVISION.
4. ADHERE PAD (ITEM 07) TO LINER (ITEM 08) OR CLAMP (ITEM 04) USING CONTACT CEMENT. TRM PAD TO MATCH.
5. TO ACCOMMODATE VARIATIONS IN ORIGINAL MANUFACTURER AND AFTERMARKET LANDING GEAR CROSS TUBES, THE LINER (ITEM 08) IS OPTIONAL. THICKNESS OF THE RUBBER PAD (ITEM 07) MAY VARY FROM 0.03" TO 0.13" AS REQUIRED.

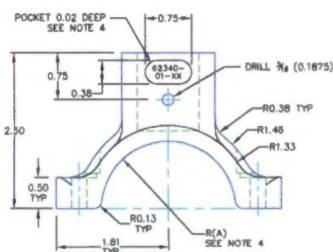
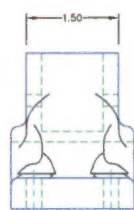
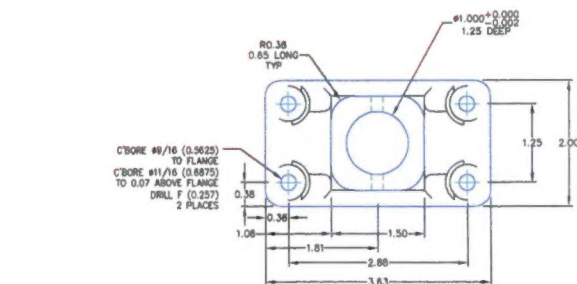
2	AN4-16A	BOLT			
4	AN960-416	WASHER			
2	MS21044N4	NUT			
1	62320-08	08 LINER	8081-T6 AL PIPE	COMMERCIAL	2" SCHEDULE 40
1	62320-07	07 PAD	NEOPRENE RUBBER	COMMERCIAL	SEE NOTE 3
1	62320-06	06 END LUG	4130 STEEL COND. N	MIL-S-18729	0.050 SHEET
2	62320-05	05 BUSHING	4130 STEEL COND. N	MIL-T-8736	3/8 X 0.049 RND. TUBE
1	62320-04	04 CLAMP	4130 STEEL COND. N	MIL-T-8736	2.5 X 0.065 RND. TUBE
1	62320-03	03 TUBE	4130 STEEL COND. N	MIL-T-8736	1.0 X 0.041 RND. TUBE
	02	--			
	01	STEP ASSEMBLY			
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC
QTY					STOCK SIZE

APPROVALS		DATE	
DRAWN:	JEFF CLARKE	13 AUG 2004	
CHECKED:	E. BURGON		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:			
DECIMALS:		ANGLES:	
X.XXX ±0.010		±1/2°	
X.XX ±0.03			
X.X ±0.1			
SCALE 1:1		DWG. NO.	
SHEET 1 OF 1		REV.	
A1		62320	
		2	

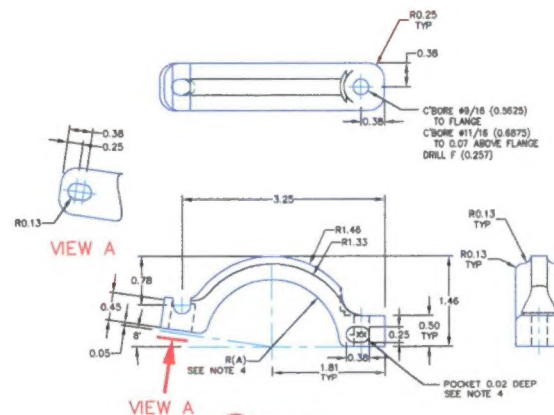
**AERO DESIGN LTD.**  
CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M  
2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 0R7  
tel: (403) 250-8087 fax: (403) 250-8383 aérodesign@aeroconsult.net

**BELL 206L SERIES, 407  
AUXILIARY STEP  
STEP ASSEMBLY**

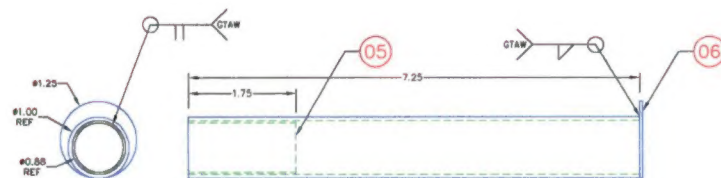
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REV	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



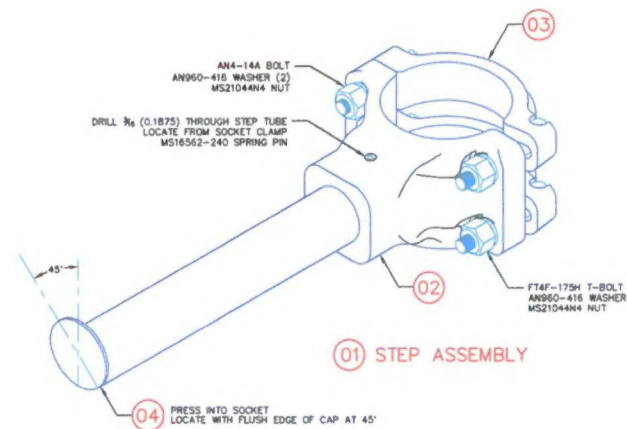
02 SOCKET CLAMP



03 CLAMP



04 STEP TUBE



01 STEP ASSEMBLY

# NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF 304/321 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2885C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.
3. THOROUGHLY DEGREASE AND POWDER COAT AFTER ASSEMBLY. APPLY STRIP OF 3M SAFETY-WALK GRIP TAPE OR EQUIVALENT ON TOP SURFACE OF TUBE.
4. ENGRAVE TEXT 0.08 HIGH, 0.007 DEEP AS FOLLOWS:

DASH NO. (XX)	RADIUS R(A)
-01	1.08
-02	1.01

QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
1	MS16562-240	SPRING PIN				3/16 X 1.5 LONG
4	MS21044N4	NUT				
6	AN960-416	WASHER				
2	AN4-14A	BOLT				
2	FT4F-175H	T-BOLT				
1	62340-06	06 CAP		321 STAINLESS STEEL	AMS 5510	0.050 SHEET
1	62340-05	05 TUBE		304 STAINLESS STEEL	ASTM A213	0.875 X 0.035 RND. TUBE
1	62340-04	04 STEP TUBE		304 STAINLESS STEEL	ASTM A213	1.0 X 0.065 RND. TUBE
1	62340-03-XX	03 CLAMP		6061-T6 ALUMINUM	QQ-A-200/B	1.0 X 3.5 BAR
1	62340-02-XX	02 SOCKET CLAMP		6061-T6 ALUMINUM	QQ-A-200/B	2.5 X 2 BAR
1	62340-01-XX	01 STEP ASSEMBLY				

LIST OF MATERIALS

APPROVALS		DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 890 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 Tel: (403) 850-8087 Fax: (403) 850-8883 www.aerodesign.ca	
DRAWN: JEFF CLARKE		26 APR 2010		
CHECKED: E. BURGON			BELL 206L SERIES & 407 AUXILIARY STEP FABRICATION	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 X.XX ±0.03 X.X ±0.1				
SCALE 1:1		DRAWN BY	DRAWN NO.	REV.
SHEET 1 OF 1		A1	62340	0



WO# 2014-65

See Build Sheet

# **MINOR CHANGE REPORT**

**MCR62340-1**

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**BELL 206B / 206L / 407**

## **PILOT PEG STEP INSTALLATION**

Radius change to accommodate Bell 206L3

Prepared by: Jeff Clarke P.Tech.(Eng.)

Revision 0, 29 August 2014

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Aero Design Ltd.



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## 1.0 INTRODUCTION

When the low mounted cargo basket is installed, any "flightstep" must be removed from the cross tube to accommodate the basket. This causes a problem for the pilot (or left seat passenger when the basket is installed on the left) when entering/departing the helicopter, as the floor is about 3 feet off the ground when high skid gear is installed (which is required for the basket installation).

This change follows a report from an operator that the pilot peg step assembly is too small to fit on the landing gear of a Bell 206L3 (S/N 51157), using the current Bell cross tube assembly (206-323-021). The current step used for the Bell 206L has an inside radius of 1.08" (2.16" diameter cross tube), with no reported issues of the radius being too small. The cross tube on this aircraft has been measured by the operator at 2.225" - 2.271" diameter.

This change is to add a configuration with the inside radius of the socket and clamps increased to 2.28" diameter.

## 2.0 MANUFACTURING REVIEW BOARD ATTENDEES

The following individuals from the Manufacturing Review Board were included in this review:

Jason Rekve – PRM

Jeff Clarke – Quality Assurance Manager, Engineering Technologist

## 3.0 DETAILS OF MINOR CHANGE

### 3.1 Affected Parts / Assemblies

Original drawing: 62340, Revision 0

Part number: 62340-02; 62340-03

Description: Socket; Clamp

### 3.2 Description of Change

1. New configuration of 62340-02 Socket added with inside radius of 1.14"
2. New configuration of 62340-03 Clamp added, with inside radius of 1.14"
3. New configurations are identified as dash no. -03.

## 4.0 ASSESSMENT

### 4.1 Impact Assessment

All sections must be answered with a yes or no.

<b>Assessment Criteria</b>	<b>Y/N</b>
<b>(a) Operating Limitations</b>	
Does the change involve or require a revision in the operating limitations specified in the approved type design?	No
<b>(b) Structural Strength</b>	
Does the change alter:	
(1) a principal component of the aircraft structure such as a frame, stringer, rib, spar, skin or rotor blade?	No
(2) a life-limited part or a structural element that is subject to a damage tolerance assessment or fail-safe evaluation?	No
(3) the strength or structural stiffness of a pressure vessel?	No
(4) the mass distribution in a structural element?	No
(5) a containment or restraint system intended for occupants or the storage of items of mass (e.g. cargo)?	No
(6) the structure of seats, harnesses, or their means of attachment?	No
<b>(c) Powerplant Operation</b>	
Does the change:	
(1) affect the power output or control qualities of the powerplant, engine, propeller, or their accessories?	No
(2) alter the approved operating limitations?	No
<b>(d) Performance and Flight Characteristics</b>	
Does the change involve alterations that:	
(1) significantly increase drag or exceed aerodynamic smoothness limits?	No
(2) significantly alter thrust or power output?	No
(3) affect stability or controllability?	No
(4) induce flutter or vibration?	No
(5) affect the stall characteristics?	No
<b>(e) Other Qualities Affecting Airworthiness</b>	
Does the change:	
(1) change the information on, or the location of, a placard required by the type design or an Airworthiness Directive?	No
(2) alter any information contained in the approved section of the aircraft flight manual or equivalent publication?	No
(3) affect the flight-crew's visibility or their ability to control the aircraft?	No
(4) affect egress from the aircraft?	No
(5) reduce the storage capacity of an oxygen system, or alter the oxygen rate of flow?	No
(6) affect flight controls or an autopilot?	No
(7) alter an electrical generation device, or the electrical distribution system between the generating source and either its primary distribution bus, or any other bus designated as an essential bus?	No
(8) reduce the storage capacity of the primary battery?	No
(9) affect a communication system required by the approved type design?	No
(10) affect instruments, or indicators that are installed as part of a system required by the approved type design?	No
<b>(f) Other Qualities Affecting Environmental Characteristics</b>	
Does the change increase aircraft noise levels or emissions?	No



## 5.0 CERTIFICATION BASIS

Aircraft: Bell 260B, 206L series, 407 – TCDS H-92

Modification: Compliance Program CP623, Revision 0

Certification Basis: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted on TCDS H-92.

This change remains in compliance with the basis of certification established for the modification.

## 6.0 JUSTIFICATION

This modification is considered minor in accordance with CAR 521.154 for the following reasons:

1. The change has been assessed in accordance with the definition of major modification in accordance with CAR 571, and found to be an other than major modification, see section 4.1.

2. Analysis

The critical section is the top clamp strap as it is in tension and has the smallest section.

The minimum cross section is at the bottom of the counter bore, and is 0.093" thick at that point.

Area of the minimum cross section  $A = 0.107 \text{ in}^2$

Tensile yield strength of 6061-T6, LT direction  $F_{ty} = 33 \text{ ksi}$   
(ref: AR-MMPS-01)

Yield tensile load  $P_{ty} = F_{ty} \times A$   
 $P_{ty} = 3531 \text{ lbs}$

Yield tensile strength of the AN4 bolt  $P_{ty\_AN4} = 3130 \text{ lbs}$   
(ref: AN3-AN20 specification sheet)

The yield strength of the bolt attaching the clamp strap is lower than the yield load the clamp strap can support.



## 7.0 IMPLEMENTATION

### 7.1 Short Term

1. New parts may be fabricated in accordance with revised drawing 62340, Revision 1, until such time as the approval documents can be revised (see long term). This report may be referenced as justification.

For the reasons listed in section 6.0

Approved: *Jawa Reh Aboi* *29 Aug 14*  
Person Responsible for Manufacturing Date

### 7.2 Long Term

1. Revise document control list DCL623 to include drawing 62340, Revision 1. Include on approval at next re-issue. *To be c/w at a later date*

Approved: *Jawa Reh* *29 Aug 14*  
Person Responsible for Manufacturing Date

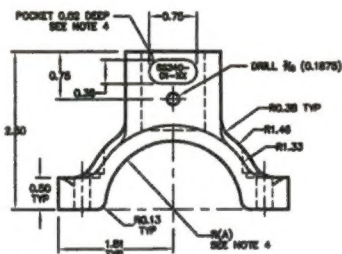
## 8.0 DOCUMENT CONTROL

The following documents have been included with or attached to the original job file (initial):

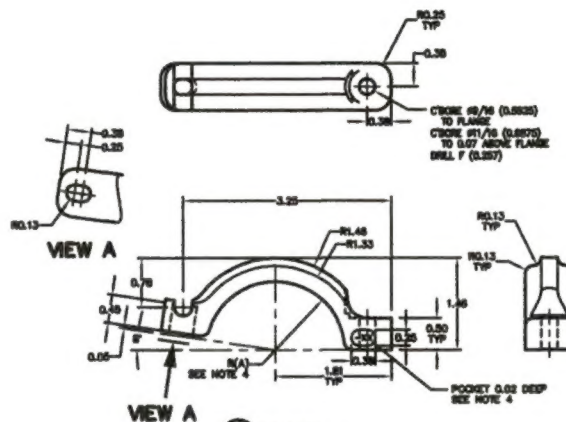
	Electronic	Hardcopy
This report	<input type="checkbox"/> by <i>OK</i>	<input type="checkbox"/> by: <i>OK</i>
Drawing 62340, Revision 1	<input type="checkbox"/> by <i>OK</i>	<input type="checkbox"/> by: <i>OK</i>

**NOTES**

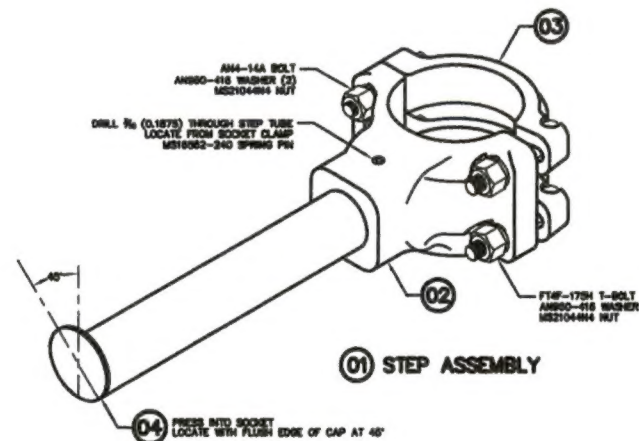
1. REMOVE ALL BURS AND BREAK SHARP EDGES.
2. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2883C. WELDING ROD SHALL CONFORM TO ER308, OR EQUIVALENT.
3. THOROUGHLY DEBURR AND POWDER COAT AFTER ASSEMBLY. APPLY STRIP OF 3M SAFETY-WALK GRIP TAPE OR EQUIVALENT ON TOP SURFACE OF TUBE.
4. DIMENSE TEXT 0.05 HIGH, 0.007 DEEP AS FOLLOWS:



**02 SOCKET CLAMP**




③ CLAMP



## 01 STEP ASSEMBLY

1	4	M820551-300	PIPING PIN			63/16 X 1.5 LONG	
1	4	M820448-61	1/8"				
1	4	NAB148P048-3P	1/4" X 3/8"				
1	4	ANA-14A	1/8"				
1	4	P149-179H	1/8"				
1	4	63340-08	CS CLAMP	304 STAINLESS STEEL	AMS 5613	0.050 SHAFT	
1	4	63340-08	CS CLAMP	304 STAINLESS STEEL	ASTM A213	0.075 X 0.005 RND. TUBE	
1	4	63340-04	CS CLAMP	304 STAINLESS STEEL	ASTM A213	1.0 X 0.005 RND. TUBE	
1	4	63340-03	CS CLAMP	3003-16 ALUMINUM	GO-A-200/5	1.0 X 3.5 BAR	
1	4	63340-02	CS SOCKET CLAMP	3003-16 ALUMINUM	GO-A-200/5	2.5 X 2 BAR	
1	4	63340-01	CS SHIP ASSEMBLY				
04	01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	QTY				LIST OF MATERIALS		

APPROVALS	DATE	 <b>AERO DESIGN LTD.</b> 8088 MALAYSIA ROAD POWELL CRYER, INC. CANADA, VISA CDS 185 MELBOURNE <a href="http://www.aerodesign.ca">www.aerodesign.ca</a>
DRAWN JEFF CLARKE	26 APR 2010	
CHECKED E. BURROGH		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		<b>BELL 206B, 206L SERIES, 407</b> <b>AUXILIARY STEP</b> <b>FABRICATION</b>
DECIMALS	ANGLES	
X.XXX ±0.010	±1/2"	
X.XX ±0.03		
X.X ±0.1		
SCALE 1 : 1		DRG NO. <b>A1</b> SHEET NO. <b>62340</b> PKG. <b>1</b>
SHEET 1 OF 1		